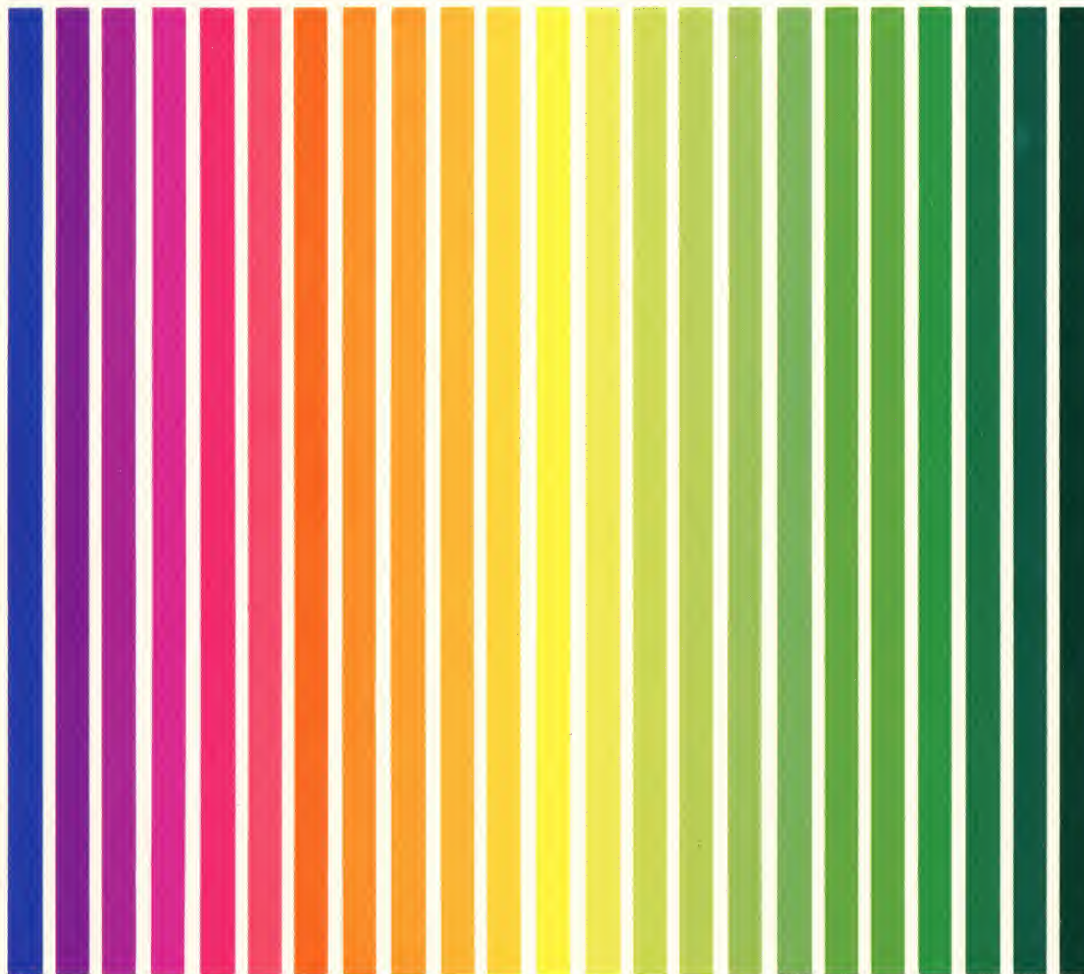


APX ATARI® PROGRAM EXCHANGE



Justin E. Wilder and Douglas J. Wilder

ULTIMATE RENUMBER UTILITY

APX-10086 APX-20086

User-Written Software for ATARI Home Computers

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by

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INTRODUCTION

OVERVIEW

The ULTIMATE RENUMBER UTILITY provides a convenient renumber function when you use ATARI BASIC with your Atari Home Computer System. It's easy and natural to use, because it operates like the built-in commands. You can change your BASIC program line numbers starting anywhere and renumbering to the end of the program. All you do is specify the starting line number in your BASIC program, the new number you want to assign this line, and your desired increment between line numbers. Or, you can accept the program's default values and simply type the direct mode command RENUMBER. Not only are numbers changed at the beginning of each line, but all references to these numbers are changed within any program statement to correspond to the new line numbers. The renumbering is carried out completely, but any reference line number not found among the lines to be changed is left as is. If renumbering cannot be completed because of insufficient memory, or if it would result in line numbers greater than ATARI BASIC allows, your program is left unchanged and the message "CANNOT RENUMBER" displays on your screen.

ULTIMATE RENUMBER UTILITY is entirely in machine language and it operates directly on a BASIC program in memory. Thus, it's very fast and it has no BASIC lines to appear with yours when you list or save your program. It reduces memory available for your BASIC program by only 599 bytes and is not affected by a NEW command or by a SYSTEM RESET.

REQUIRED EQUIPMENT

Cassette version

8K RAM

ATARI 410 Program Recorder

Diskette version

16K RAM

ATARI 810 Disk Drive

ATARI BASIC Language Cartridge (for your BASIC programs)

CONTACTING THE AUTHORS

Users wishing to contact the authors about ULTIMATE RENUMBER UTILITY may write to Justin E. Wilder at:

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GETTING STARTED

LOADING ULTIMATE RENUMBER UTILITY INTO COMPUTER MEMORY

1. If you have another program in memory, save it on cassette or diskette, because you must turn off your computer to load this utility.
2. If you have an ATARI 850 Interface Module, make sure it's turned off before you load in ULTIMATE RENUMBER UTILITY. You can turn it on later so that you can use a printer connected to the parallel port, but the RS232C ports won't be usable while this utility is in memory.
3. If you have the cassette version of ULTIMATE RENUMBER UTILITY:
 - a. Have your computer turned OFF.
 - b. Insert the ULTIMATE RENUMBER UTILITY cassette into the program recorder's cassette holder and press REWIND on the recorder until the tape rewinds completely. Then press PLAY to prepare the program recorder for loading the program.
 - c. Turn on the computer while holding down the START key.
 - d. When you hear a beep, release the START key and press the RETURN key. The program will load into computer memory and start automatically.

If you have the diskette version of ULTIMATE RENUMBER UTILITY:

- a. Have your computer turned OFF.
- b. Turn on your disk drive.
- c. When the BUSY light goes out, open the disk drive door and insert the ULTIMATE RENUMBER UTILITY diskette with the label in the lower right-hand corner nearest to you. (Use disk drive one if you have more than one drive.)
- d. Turn on your computer and your TV set. The program will load into computer memory.

THE DISPLAY SCREEN

When the program has loaded into computer memory, the READY prompt appears on your TV screen to tell you that the utility is in memory and ready to use whenever you need it.

USING A DIFFERENT FILE FOR THREE- OR FOUR-DISK SYSTEMS

Users having one or two disk drives use the AUTORUN.SYS file on the APX diskette, which is the utility's object file. (As is true for all APX diskettes, it's a good idea to duplicate this file onto another diskette and store the APX diskette as your backup.) The APX diskette also contains a file named RENUMBER.4DR. This file is the utility's object

file for anyone using three or four disk drives. The current AUTORUN.SYS file sits in the wrong location in RAM for such expanded systems and needs to be relocated. If you have three or four drives, use DOS-II option C to copy the file to another diskette, renaming it AUTORUN.SYS as you copy it (the response to the option prompt is D:RENUMBER,4DR,D2:AUTORUN.SYS).

USING ULTIMATE RENUMBER UTILITY

RENUMBER COMMAND FORMAT

When you want to renumber a BASIC program in memory, type the RENUMBER command (you can abbreviate it to REN.--be sure to include the period). The command format is:

```
RENUMBER [lineno][,lineno [,incr]]
```

The first parameter is the line number at which you want the renumbering to start. The program rennumbers all lines from this one to the end of your program. If your program doesn't have the line number you specify, the program starts renumbering at the next higher line number. The default value is zero.

The second parameter is the new line number you want to assign the first line to be renumbered. To avoid overlapping with lines that aren't renumbered, this parameter must be at least as great as the first parameter. If you do specify a value less than the first parameter, the program assigns it the same value as the first parameter. The default value is ten.

The third parameter is the increment you want used between line numbers of your renumbered program. If you specify zero, the program assigns this parameter a value of one. The default value is ten.

Specifying parameter values

All parameters are optional. The program uses the default value(s) for any parameter(s) you don't specify. For example, to renumber a program from line 120 to the end, using the default increment of 10, the command is REN.120 <RETURN>. By typing a comma instead of a value, you may omit parameters for which you want to use the default value and then specify the value(s) for the subsequent parameter(s). For example, to renumber a program from the beginning to the end, using 10 as the new starting line number and an increment of 5, the command is REN,,,5 <RETURN>. If you accept the utility's default values for all three parameters, then you need type only RENUMBER (or REN.) and press the RETURN key.

Numeric values for parameters

The program rounds any noninteger parameters you use to the nearest integer value. Any number greater than 32767 or less than 0 produces an error message.

CHECKING EXPRESSIONS AS LINE NUMBER REFERENCES

A powerful feature of ATARI BASIC is the use of expressions or variables in place of line number references. Since we can't be sure such references are correct after renumbering, any program lines with expression or variable line number references are listed on the screen after the renumbering process is completed. The utility displays the number of each line in which one is found, with the message "CHECK EXPRESSION IN LINE". The line number repeats for each statement containing such an expression in the line. Check all

these expressions to make sure they're correct for the new line numbers. A feature of ULTIMATE RENUMBER UTILITY helps you to check: if the expression begins with a number, the program treats the first number in the expression as a tie to a specific line number and makes the corresponding change. For example, in the expression "RESTORE 300+10*A", the "300" is subject to renumbering but the "10" is not. Likewise, in "GOTO MARK+100" the "100" would not be changed because it isn't the first value in the expression. If you write programs with this feature in mind, your effort required to check such line references will be less, but you must still check any expression for a line number reference after using the renumber program.

If your program contains more than twenty statements with expressions for line numbers, the first twenty display on the screen, followed by the message "& MORE". To find the rest, you can temporarily insert "REM" between the line number and statement of some of these and renumber again, using the same parameters as before.

References to lines that don't exist remain unchanged.

MOVING BLOCKS OF CODE

You can move blocks of lines from one part of your program to another. To do so, LIST the part on cassette or diskette that you want to place earlier in the program. Next, renumber the lines above the new location to be higher than those being moved. Then ENTER the lines back into memory from the cassette or diskette. Finally, correct any line number references between the moved part and the part that was renumbered while it was on cassette or diskette and remove the extra lines by typing each line number and pressing the RETURN key.

IF PART OF RENUMBER PROGRAM IS LOST

If you lose part of the renumber utility because you called DOS without having a MEM.SAV file, or because you did a POKE in memory, the whole program disengages upon your next keyboard input. The screen clears and the program ignores your next line of BASIC from the keyboard, but your BASIC program is protected against a computer malfunction due to faulty machine code.

ADVANCED TECHNICAL INFORMATION

MEMORY AND VECTOR USAGE

The ULTIMATE RENUMBER UTILITY uses page six in RAM for subroutines. The boot operation starts loading in the last part of page five, putting all of the boot code where it will later be overwritten by BASIC so that it does not occupy memory when it is no longer of any use. The address in the MEMLO vector is changed, moving up the starting point for the BASIC program by 599 bytes, and the main renumber program is inserted in this space.

The list of line numbers to be changed starts just above the BASIC program in the area reserved for contents of dimensioned strings and arrays, and continues upward through the screen memory if needed. A GRAPHICS 0 command is executed as renumbering is completed to re-establish the display list and clear the screen of this data. The printer buffer is used to store numbers of the lines containing expressions for line number references. Other temporary data is stored in parts of RAM page zero used by BASIC in floating point calculations.

The keyboard interrupt vector is used to set up a return to the renumber search routine whenever a RETURN is processed by the operating system. When it is finished, the renumber routine returns control to BASIC with an RTS operation. The initialization vector is used to establish the MEMLO and keyboard interrupt vectors at startup and whenever SYSTEM RESET is pushed to make this program SYSTEM RESET-proof. The initialization routine near the end of page six is the only part executed after the renumber program is disengaged when some of the code is lost.

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ATARI PROGRAM EXCHANGE

REVIEW FORM

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many software authors are willing and eager to improve their programs if they know what users want. And, of course, we want to know about any bugs that slipped by us, so that the software author can fix them. We also want to know whether our documentation is meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program _____

2. If you have problems using the program, please describe them here.

3. What do you especially like about this program?

4. What do you think the program's weaknesses are?

5. How can the catalog description be more accurate and/or comprehensive?

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program?

- _____ Easy to use
- _____ User-oriented (e.g., menus, prompts, clear language)
- _____ Enjoyable
- _____ Self-instructive
- _____ Useful (non-game software)
- _____ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

8. What did you especially like about the user instructions?

9. What revisions or additions would improve these instructions?

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

11. Other comments about the software or user instructions:



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